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correspondence between the bulk of the "rhinophores" and the dimensions of the collar or collars.

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NOTE ON THE HABITAT OF GEONEMERTES AGRICOLA[1]

THE terrestrial nemerteans include a small number of species, all belonging, apparently, to one genus, but widely scattered over the world. They occur conspicuously on islands, some of which are well removed from any large mainland. The origin of these land nemerteans is a matter of some interest, and several suggestions have been made relative to the manner of their evolution. One of these terrestrial nemerteans, *Geonemertes agricola* (W.-S.), was found at Bermuda by v. Willemoes-Suhm (1874). The anatomy of this species was subsequently described in detail by Coe (1904), who gave some attention, also, to the habits of the worm. These observers, as well as Verrill (1902), agree that *G. agricola* is to be found "only along the shores of mangrove swamps and on the adjacent hillsides" (Coe, p. 566). Coe found it "not only above high-water mark but also for some distance along a zone which is covered for a short time each day with sea water," but noted that the intertidal individuals were "as a rule smaller than those living in the soil which is a little above the reach of the tide, but in earth which is nearly saturated with salt water."

Standing bodies of fresh water are absent in Bermuda. Coe consequently held that this particular species, at least, represents a land nemertean which has almost certainly been derived directly from a marine ancestor, and not, as Montgomery (1895, p. 483) had argued for the generality of land nemerteans, from a fresh-water form.

During the past several years I have repeatedly encountered *G. agricola* in a type of habitat which is significantly different from that recorded for this nemertean by the observers just quoted. In the neighborhood of every large or small mangrove "creek" or swamp which I have examined, the worm has been found, in relatively considerable quantities, well below low-water mark even at spring tides. The species occurs in the localities listed by Coe, but is also common among the masses and sheets of matted sea weeds (*Laurentia, Valonia, Halimeda,* and associated plants) which cover the bottom of Fairyland Creek. Specimens were also obtained from under rocks situated a few feet beneath low-water level, in muddy bays bordered by mangroves, such as Tucker's Bay in Harrington Sound. The individuals collected in these places embraced white forms, some with a tinge of pink, others decidedly pink (as in the "pale" form figured by Coe, 1904, Pl. 1). They were 30–60 mm. in length, and some contained embryos.

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[1] Contributions from the Bermuda Biological Station for Research, No. 76.

In June and in July young *Geonemertes* were gotten among sea weeds in Fairyland Creek; these were 6–12 mm. in length. They were identified principally through the microscopic examination of the stylets and other organs. The stylets and stylet basis in these young specimens were of the juvenile type for this species, as figured by Coe (1904, Pl. 25, Figs. 21, 24, 25). These young specimens were in some cases pure white, in others tinged with "smoky brown." I found no pinkish specimens less than 30 mm. in length.

The observations upon the specimens of this species inhabiting salt water indicate, as Coe concluded from his study of the land-living individuals, that liberation of the young occurs in June and in July. My largest examples of *G. agricola* from the water were obtained in the spring.

Large specimens of *G. agricola* are negatively phototropic, the ocelli occupying the region of the body most sensitive toward light. They orient away from the light with diagrammatic precision. This response leads to their being found, during the day, under stones and about the roots of algæ.

It is hardly possible to credit the view that *G. agricola* has extended the variety of its habitats during the brief time since Coe's studies were made (1903); it is therefore necessary to believe that this species of nemertean is not only terrestrial in the proper sense, but truly marine as well. There seems no good ground upon which to distinguish and separate the individuals found respectively on land, in the intertidal zone, and definitely in the sea water. The terrestrial "variety" may then be regarded as having originated, perhaps not so very long ago, from the form which is undoubtedly marine—unless one is prepared to believe that, introduced as a terrestrial form, it has at some time secondarily taken to the sea after a protracted evolution as a land animal. This case seems to have some resemblance to that of a grapsoid crab at Bermuda, *Sesarma ricordi* M.-Edw., of which a terrestrial variety has been described by Verrill (1908, p. 328). It is my impression that the larger marine specimens of *G. agricola* are less hardy, more easily caused to fragment by handling, than are those taken on land. This may, however, be merely a physiological consequence of differences in habitat, which could be exhibited within the life-history of a single individual. I have not been able to keep the salt water specimens alive after abruptly transferring them to damp earth. The young individuals, however, are quite hardy, and seem capable of enduring this treatment for several days at least.

These observations add further, and possibly final, weight to the argument that some, at least, of the land nemerteans have proceeded directly from ancestors inhabiting salt water.

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